CLAIMS

1. A sensor (10) for sensing the interface pressure between two bodies, the sensor having at least two intercommunicating detection zones (11), each detection zone being formed inside an inflatable envelope (12) for interposing between said bodies and having two opposite regions whose spacing apart depends on the interface pressure between said bodies, each detection zone including a detector (15a, 15b) arranged to deliver information associated with the spacing between the opposite regions (12a, 12b).

2. A sensor according to the preceding claim, characterized by the fact that the number of detection zones (11) is greater than two, and in particular lies in the range two to 100.

3. A sensor according to either preceding claim, characterized by the fact that at least one envelope (12) of a detection zone (11) is made at least in part out of a material that is elastically deformable.

4. A sensor according to any preceding claim, characterized by the fact that the detection zones (11) are arranged in a two-dimensional array.

5. A sensor according to any preceding claim, characterized by the fact that at least one of the detection zones (11) includes a detector arranged to measure the spacing between the two opposite regions of the envelope of the detection zone (11).

6. A sensor according to any preceding claim, characterized by the fact that it includes a detector (15) selected from the following list: an electrical detector, in particular an electrical detector relying on

contact or capacitance; an optical detector, in particular an optical fiber detector, a diffraction detector, or an optical focus detector; a magnetic detector, in particular an induction detector using a linear wire or a coil, or a Hall effect detector; or a thermal detector.

7. A sensor according to any preceding claim, characterized by the fact that the detector (15) associated with a detection zone (11) comprises a portion of an element (15b) that is common to a plurality or even all of the detection zones, and an element (15a) specific to said detection zone, in particular a portion of an electrical conductor (15b) that is common to a plurality, or even to all of the detection zones, preferably connected to electrical ground, and an electrical conductor (15a) specific to said detection zone.

8. A sensor according to any preceding claim, characterized by the fact that the information associated with the spacing between the regions (12a, 12b) of the envelope (12) is binary.

9. A sensor according to any preceding claim, characterized by the fact that the detector comprises at least two elements (15a, 15b) disposed respectively on each of the inside faces (14a, 14b) of facing regions (12a, 12b) of the envelope (12), in particular two electrical conductors made by etching on a medium coated in a conductor metal, in particular polyimide coated in nickel.

10. A sensor according to any preceding claim, characterized by the fact that at least one detection zone (11) includes a non-rectilinear electrical conductor

(15b), in particular an electrical conductor extending in a zigzag configuration.

11. A sensor according to any preceding claim, characterized by the fact that it includes a fluid admission (21) common to all of the detection zones (11) of the sensor.

12. A sensor according to any preceding claim, characterized by the fact that it includes at least one fluid admission (21') external to the detection zones (11) and serving each of them externally.

13. Apparatus for measuring the interface pressure between two bodies (Sa, Sb), the apparatus being characterized by the fact that it includes at least one sensor (10) as defined in any preceding claim together with a pressure generator (20) arranged to deliver a fluid into the detection zones (11) of the sensor (10), at a pressure that varies in time.

14. Apparatus according to the preceding claim, characterized by the fact that the pressure generator (20) is arranged in such a manner as to cause the pressure to vary with a periodic function that is continuous, and in particular by following a function that is sinusoidal or a sawtooth function.

15. Apparatus according to claim 13 or claim 14, characterized by the fact that the apparatus is arranged to detect the last separation between facing regions (12a, 12b) of a detection zone (11) amongst a set of detection zones (11), and then to cause the pressure applied by the pressure generator (20) to diminish.

16. Apparatus according to any one of claims 13 to 15, characterized by the fact that it includes a processor system (30) for processing information delivered by the detector of at least one detection zone, and in particular a processor system arranged to respond to information delivered by the detector (15) in a detection zone (11) to determine the interface pressure between the two bodies at a given instant, at the location of said detection zone.

17. Apparatus according to the preceding claim, characterized by the fact that the processor system (30) is arranged to establish a map of interface pressures between the two bodies at a given instant, and is preferably arranged to update said map in particular whenever a detector (15) changes state, or an predefined time intervals.

18. Apparatus according to any one of claims 13 to 17, characterized by the fact that it is arranged to limit the inflation flow rate of the detection zones.

19. Apparatus according to any one of claims 13 to 18, characterized by the fact that it is arranged to limit the quantity of inflation fluid in the detection zones.

20. Apparatus according to any one of claims 13 to 19, characterized by the fact that it is arranged to detect a leak from one or more detection zones.

21. Apparatus according to any one of claims 13 to 20, characterized by the fact that the processor system (30) is arranged to detect a soft point.

22. Apparatus according to any one of claims 13 to 21, characterized by the fact that the processor system (30) is arranged to detect a hard point.

23. A method of measuring the interface pressure between two bodies, the method being characterized by the fact that it comprises the following steps:

· placing a sensor as defined in any one of claims 1 to 12 between the two surfaces;

· delivering a fluid into the detection zones of the sensor and causing the pressure within the detection zones to vary; and

· determining the interface pressure between the two bodies at a given instant at the location of a detection zone on the basis of information delivered by the detector of the detection zone.

24. A method according to the preceding claim, implemented to measure the interface pressure between two surfaces of two soft bodies, or of a soft body and a hard body, or within a soft body, in particular between two surfaces of at least one soft body selected from the following list: a portion of the human body or a body simulating such a portion, in particular the head of a fetus, muscles, skin, mucous membranes, internal cavities; between a portion of the human body and an element interacting with the human body, e.g. a seat, a mattress, garments, the inside of a helmet, elastic stockings or fabric; to determine the hardness of a textile, of a lining material, of an elastomer; to determine the state, in particular the ripening state of produce, in particular vegetables or fruit by determining their hardness.

25. An obstetric forceps (50) comprising two blades (51, 52) each having an inside face (53) for coming into

contact with the head of a fetus or a body simulating such a head, and each having an outside face (54), the forceps being characterized by the fact that it includes at least one sensor (10) as defined in any one of claims 1 to 12.

26. A forceps according to the preceding claim, characterized by the fact that at least one sensor (10) is disposed on the inside face (53) of at least one blade (51, 52).

27. A forceps according to either one of the two immediately preceding claims, characterized by the fact that at least one sensor (10) is disposed on the outside face (54) of at least one blade (51, 52).

28. A forceps according to any one of claims 25 to 27, characterized by the fact that the or each sensor (10) includes a plurality of detection zones (11) disposed on the periphery of one of the faces of at least one blade (51, 52).

29. A forceps according to any one of claims 25 to 28, characterized by the fact that the blades (51, 52) of the forceps are covered in at least one flexible protective cover which also covers the detection zones of the sensor.

30. A seat including at least one sensor (10) as defined in any one of claims 1 to 12.

31. A seat according to the preceding claim, characterized by the fact that it includes a seat proper having the sensor(s) (10) disposed thereon.

32. A seat according to the preceding claim, characterized by the fact that there are two sensors (10), and by the fact that the sensors share a common fluid admission.

33. A seat according to any one of claims 30 to 32, characterized by the fact that each sensor (10) includes a plurality of detection zones (11) disposed at the intersections of a grid.

34. A seat according to the preceding claim, characterized by the fact that the detection zones are grouped together in twos or threes in elongate portions of the envelope (12).

35. A method of preventing the formation of sores in the sitting position the method comprising the following steps:

- placing at least one as defined in any one of claims 1 to 12 on a seat on which the patient is sitting;
- measuring the interface pressure between the seat and the patient's buttocks; and
- modifying the points where the patient bears against the seat and/or changing the seat or its seat proper.

36. A clamping or grasping device, characterized by the fact that it includes at least one sensor (10).

37. A device according to the preceding claim, characterized by the fact that it comprises at least one clamp.

38. A clamping or grasping method comprising the following steps:

· clamping or carrying an article using a grasping or clamping device provided with at least one sensor as defined in any one of claims 1 to 12; and

· measuring the interface pressure between the grasping or clamping device and the article.

39. The use of a sensor as defined in any one of claims 1 to 12 in any one of the following devices: an anti-sore device, mattress, seat, in particular car seat, garments, helmet, elastic stockings or fabric, a device for grasping or clamping a body that is soft and/or of irregular shape and/or of fragile nature, a hydraulic or pneumatic lifting device, or a device for placing in an internal cavity of the human body, or a device for measuring the degree of ripening of produce, in particular fruit or vegetables.